DOCUMENT RESUME

ED 347 502 CS 010 975

AUTHOR Armbruster, Bonnie B.; Armstrong, James O.
TITLE Locating Information in Text: A Focus on Children in the Elementary Grades.
INSTITUTION Center for the Study of Reading, Urbana, IL.
SPONS AGENCY Office of Educational Research and Improvement (ED), Washington, DC.
REPORT NO CSR-TR-557
PUB DATE Jul 92
CONTRACT G0087-C1001-90
NOTE 26p.
PUB TYPE Information Analyses (070)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Elementary Education; *Elementary School Students; *Information Retrieval; Literature Reviews; Prior Learning; Reading Research; *Reading Strategies; *Search Strategies; Text Structure
IDENTIFIERS Strategic Reading; *Text Factors

ABSTRACT

A review was conducted of the research related to the ability of elementary school children to carry out search tasks with informational text. The review was organized within a framework of components of the search process: goal formation, text selection, information extraction and integration, and evaluation. The research reviewed suggests that older and more proficient readers are better able than younger and less proficient readers to execute search tasks successfully and spontaneously. Other factors, such as the considerateness of text and the reader's prior knowledge of text structure and topic, were also shown to affect children's ability to search informational text. Two recommendations based on the research review are: (1) teachers should provide systematic instruction in how to locate information in text, beginning in the primary grades; and (2) much more informational text should be added to the reading diet of elementary school students. (A figure representing the types of search goals or tasks is included; 64 references are attached.) (Author/RS)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED347502

Technical Report No. 557

LOCATING INFORMATION IN TEXT: A FOCUS ON CHILDREN IN THE ELEMENTARY GRADES

Bonnie B. Armbruster
James O. Armstrong
University of Illinois at Urbana-Champaign

July 1992

Center for the Study of Reading

TECHNICAL
REPORTS

College of Education
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN
174 Children's Research Center
51 Gerty Drive
Champaign, Illinois 61820

CS010975

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
✓ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

BEST COPY AVAILABLE

CENTER FOR THE STUDY OF READING

Technical Report No. 557

LOCATING INFORMATION IN TEXT: A FOCUS ON CHILDREN IN THE ELEMENTARY GRADES

Bonnie B. Armbruster
James O. Armstrong
University of Illinois at Urbana-Champaign

July 1992

College of Education
University of Illinois at Urbana-Champaign
174 Children's Research Center
51 Gerty Drive
Champaign, Illinois 61820

1991-92 Editorial Advisory Board

James Armstrong

Diana Beck

Stacy Birch

Diane Bottomley

Clark A. Chinn

Judith Davidson

Irene-Anna N. Diakidoy

Colleen P. Gilrane

Barbara J. Hancin-Bhatt

Richard Henne

Carole Janisch

Bonnie M. Kerr

Raymond Langley

Jane Montes

Marty Waggoner

Janelle Weinzierl

Hwajin Yi

MANAGING EDITOR
Fran Lehr

MANUSCRIPT PRODUCTION ASSISTANT
Delores Plowman

Abstract

A review was conducted of the research related to the ability of elementary school children to carry out search tasks with informational text. The review was organized within a framework of components of the search process: Goal Formation, Text Selection, Information Extraction and Integration, and Evaluation. The research reviewed suggests that older and more proficient readers are better able than younger and less proficient readers to execute search tasks successfully and spontaneously. Other factors, such as the considerateness of text and the reader's prior knowledge of text structure and topic, were also shown to affect children's ability to search informational text. Implications for instruction are discussed.

LOCATING INFORMATION IN TEXT: A FOCUS ON CHILDREN IN THE ELEMENTARY GRADES

In school, children search text for answers to questions, pursue evidence in support of a point, and seek information on topics of interest. Recognition of the importance of locating information is evident in the fact that it is assessed on standardized tests and taught in commercially published programs, such as basal programs in reading and social studies.

In this report we review research related to the ability of elementary school children to search text to locate information. We conclude with some reflections on the educational implications of this research.

What is Involved in Locating Information?

Locating information is a type of strategic reading (Guthrie & Mosenthal, 1987). Strategic readers have the following characteristics: (a) They have a purpose or goal for reading, which defines the reading task; (b) They analyze the task and all the factors that affect it; (c) From an analysis of the task, the text, and their own cognitive and affective resources, strategic readers carefully select tactics appropriate for achieving their goal; (d) They monitor their comprehension, thinking, and learning; and (e) They are flexible, changing their strategy as necessary to achieve their goal (Wade & Armbruster, in press).

Guthrie and his colleagues have addressed the more specific question of what is involved in the subset of strategic reading of interest here--locating information. Guthrie and Mosenthal (1987) propose a model of the subprocesses of information location. The components of their model are:

1. formulate a goal,
2. inspect appropriate categories of information,
3. sequence the inspection,
4. extract details from one or more categories, and
5. recycle to obtain a solution.

Dreher (1992) presents a variation of this model, with the following five components:

1. goal formation--formulating a goal or plan of action,
2. category selection--selecting appropriate text sections or categories (e.g., table of contents) for inspection,
3. information extraction--extracting the relevant information from the selected categories,
4. integration--integrating the extracted information with prior knowledge of the topic, and
5. recycling--repeating the preceding processes until the search task is completed.

We wanted to organize our review to parallel the components of these process models of information location. However, because the models are not identical and because we could find no research bearing on some components, we modified the models somewhat to serve as the framework for our review. The

following categories comprise the first four sections of our paper: Goal Formation, Text Selection, Information Extraction and Integration, and Evaluation.

Goal Formation

Both process models include goal formation as the first step. In this section we address two questions: What types of search tasks or goals do elementary children have? and What do they know about these tasks?

Types of Search Goals

We begin with a logical analysis of the possible types of search goals that students might have. We postulate three dimensions of the goal or task variable. One dimension is *Source* of goal: The source of the goal may be *external* (e.g. questions asked by teachers or textbooks) or *internal* (i.e., self-generated by the reader). Another dimension is *Time* of goal formation: The goal may be established *before reading* (to locate information in previously unread text) or *during/after reading* (to locate information that has been read but forgotten). The third dimension is *Specificity* of goal. This continuous dimension represents goals that range from very *specific* (for example, a literal question) to very *general* (for example, a broad research topic). In Figure 1, these three dimensions are represented in a matrix that includes examples of possible tasks for elementary students.

[Insert Figure 1 about here.]

Unfortunately, there is little research to inform us about the *actual* tasks in elementary school that initiate goals for locating information. Certainly one prevalent task is the questions asked by teachers and textbooks (external sources according to the matrix in Figure 1). Of course, not all questions asked in classrooms initiate text search. Teachers ask questions for a variety of purposes, such as to check whether students have read, to see whether they were paying attention, to evaluate understanding, and to review important information (O'Flahavan, Hartman, & Pearson, 1988). Teachers also ask rhetorical questions, or questions that serve some purpose other than to elicit a response (Armbruster et al., 1991). Likewise, questions in textbooks may serve a variety of functions, such as activating prior knowledge, setting a purpose for reading, or encouraging critical thinking.

Although not all questions qualify as search goals, it may still be useful to examine the kinds of questions asked in classrooms. Research has focused on the cognitive demands of questions, a variable related to the Specificity dimension of the matrix in Figure 1.

Teacher questions. Most research on teacher questioning has revealed that teachers ask primarily factual or memory-type questions focusing on details or isolated bits of information (see, e.g., Alvermann & Hayes, 1989; Ciardello, 1986; Daines, 1986; Gall, 1970, 1984; Good & Brophy, 1973; Guszak, 1967; Pearson & Gallagher, 1983; Wilen, 1982, 1984). In a review of research on teachers' questioning practices from 1912 to 1967, Gall concluded that "about 60% of teachers' questions require students to recall facts; about 20% require students to think; and the remaining 20% are procedural" (1970, p. 713). The preponderance of lower level teacher questions has been verified at all grade levels in a variety of subject areas (Wilen, 1982).

An oft-cited study of questioning is Guszak's (1967) investigation of text-based questions asked by second-, fourth-, and sixth-grade teachers during reading instruction. Influenced by the work of Bloom, Engelhart, Furst, Hill, and Krathwohl (1956), Guszak classified the questions into six categories: *recognition* questions requiring students to use literal comprehension skills to locate information in text; *recall* questions eliciting the recall of factual material; *translation* questions calling for paraphrase or interpretation; *conjecture* questions requiring prediction; *explanation* questions eliciting inferences; and

evaluation questions demanding judgments of worth or acceptability. Guszak found a strong emphasis on recognition and recall questions, which constituted about 70% of all questions asked.

Although most research supports Guszak's findings, three studies provide interesting contrasts. Hare and Pulliam (1980) replicated and extended Guszak's study by analyzing questions written by 35 first- through fifth-grade teachers, first using Guszak's classification scheme and then using Pearson and Johnson's (1978) question types: *textually explicit* (requiring little or no inference), *textually implicit* (requiring some inference), and *scriptally implicit* (requiring the reader's prior knowledge). When they used Guszak's question types, the researchers found results consistent with Guszak's--about 74% of questions were in the recognition and recall categories. However, using Pearson and Johnson's question types, Hare and Pulliam found only about 27% of questions in the textually explicit category, leaving about 73% for the textually implicit and scriptally implicit categories.

O'Flahavan et al. (1988) used Guszak's question types to analyze the questions asked by 15 second-, fourth-, and sixth-grade teachers during reading instruction. These researchers found that about 43% of the questions were recognition and recall; this figure dropped to about 32% if questions requiring background knowledge were included in the analysis (recall that Guszak analyzed only text-based questions).

Finally, Armbruster and colleagues (1991) analyzed teacher questions in 12 fourth-grade science and social studies lessons in which a textbook was used as a focus of instruction. Questions were classified according to the expected source of answers: *text explicit, text implicit, scriptally implicit, graphics,* and *activities*. Results included the following: The scriptally implicit category accounted for half of the questions; text-based answers accounted for 27% of the questions; and of the text-based answers, text explicit outnumbered text implicit 2 to 1. In other words, fewer than 1 out of every 10 questions teachers asked required students to make an inference from the text they had read.

Textbook questions. Another external goal that prompts children to search text is questions found in textbooks. Textbooks almost always contain questions at the ends of sections, chapters, and units. Questions may also precede text segments or be embedded in the text itself.

We located three studies (two of them quite dated) of questions in content area textbooks. In a study by Davis and Hunkins (1965), all questions in a sample of chapters from three fifth-grade social studies textbooks were analyzed using Bloom's taxonomy. The researchers concluded that about 87% of the questions required knowledge of specifics, while only about 9% required comprehension. Also using Bloom's taxonomy, Trachtenberg (1974) analyzed all study questions, exercises, activities, and test items in nine sets of commercially published world history materials. Of the almost 62,000 items analyzed, an average of about 63% were "knowledge" and about 36% were "comprehension" items. Finally, Armbruster and Ostertag (in press) analyzed approximately 7,500 questions from fourth- and fifth-grade science and social studies textbooks and teacher's manuals and found that about half of the questions required little or no inference.

In summary, research reveals that children are asked a high proportion of recognition- and recall-type questions, or in our terms, *specific* questions. It is not known what proportion of questions are intended to initiate, or actually result in, text search. However, it seems reasonable to assume that textbook questions might prompt text search more than general teacher questions, which often are not text-based.

Besides research on questions, we could find no other studies on the types of text-based search tasks elementary children encounter.

Children's Knowledge of Tasks

What do children know about tasks? Can they translate externally imposed goals into appropriate search tasks? Can they initiate their own search tasks?

When tasks are externally imposed, such as questions, the reader must first recognize that the task requires locating information in text. Research indicates that younger and poorer readers may not be able to recognize when questions provide the occasion for a text-based search. For example, Raphael, Winograd, and Pearson (1980) investigated the responses of fourth-, sixth-, and eighth-grade children to textually explicit, textually implicit, and scriptally implicit questions. More skilled readers were both more sensitive to the appropriate information sources for answering the questions and more successful in answering the questions than were less skilled readers. The relevant finding here is that less skilled readers sometimes did not recognize that textually explicit and textually implicit questions are occasions for establishing goals for locating information in text.

Garner, Wagoner, and Smith (1983) investigated more directly children's ability to translate external goals into appropriate search tasks. In this study, good- and poor-comprehending sixth graders tutored fourth graders in answering questions following the reading of an expository passage. Some of the questions were text-based, thus necessitating rereading the text; others were reader-based questions eliciting the reader's opinion. One behavior of interest was the number of times the tutors correctly differentiated questions, that is, encouraged lookbacks for text-based questions (when lookbacks were appropriate) versus reader-based questions (where lookbacks were inappropriate). The results included the finding that good comprehenders differentiated text-based from reader-based questions for their tutees significantly more often than poor comprehenders. In other words, good comprehenders were more able than poor comprehenders to distinguish when questions were text-based, thus establishing the goal of locating information in text.

Other research on children's knowledge of tasks concerns internal sources, when readers initiate their own goal for locating information. One occasion for a self-generated search goal is the desire or need to find new information in previously unread text--a Before-Reading task in the matrix in Figure 1. For example, a child may be eager to find a specific fact about a dinosaur or to locate general information about robots.

The only relevant research we could find about an internal goal source before reading is a study by Kobasigawa (1983). Part of this study involved giving fourth and eighth graders a short paragraph about China and asking them to generate topics or questions for a research project based on the paragraph. The children's self-generated questions were then classified into Known (if answers to the questions were already given in the material) or Unknown (if answers required new information). The Unknown category was further divided into two subcategories: Single Fact and Open-Ended (roughly corresponding to the anchors of our Specificity dimension). One result of the study was that all of the eighth-grade children but only half of the fourth-grade children were able to generate at least one research topic or question. Furthermore, eighth graders provided significantly more Unknown questions, particularly in the Open-Ended subcategory. Although the results of this study are hardly conclusive, they suggest a developmental trend in ability to generate search goals--especially more open-ended or general goals--for previously unread information.

Another occasion for generating a search goal that occurs during or after reading is detecting a comprehension problem that can be resolved by rereading. A large body of research has investigated metacognition in children, including their ability to detect barriers to comprehension. Numerous studies have demonstrated that younger children and poorer readers apparently do not realize when they fail to understand what they are reading (for a review, see Brown, Bransford, Ferrara, & Campione, 1983). For example, a study by Garner and Reis (1981) suggests that the ability to generate a search goal to

BEST COPY AVAILABLE

resolve a comprehension problem develops gradually. In this study, good and poor comprehenders in Grades 4-8 were presented with a passage divided into three segments. The passage contained four "lookback" questions (questions presented in one segment but demanding retrieval of previously presented information). The students were observed for signs of comprehension monitoring (recognition of difficulty while answering questions) and attempts to remedy failure on questions by looking back in the text. Poorer comprehenders at the sixth-, seventh-, and eighth-grade levels failed to either monitor or correct comprehension failures. Better comprehenders in sixth and seventh grades monitored comprehension but did not spontaneously use lookbacks. Eighth-grade better comprehenders, on the other hand, both monitored comprehension and "fixed up" comprehension failures by looking back to relevant sections of the text. The pertinent results here are that only older and better comprehenders recognized that a comprehension failure had occurred. Obviously, if readers do not even recognize a problem, they are unlikely to generate a goal for searching text to solve the problem.

The limited number of relevant research studies that we could find indicate that children's knowledge of search tasks appears to develop gradually. Younger and poorer readers may not be able to carry out externally imposed search goals. Similarly, younger and poorer readers may be less able than older and better readers to generate search goals.

Text Selection

After goals are established, Guthrie and Mosenthal (1987) propose two related steps of "inspect appropriate categories of information" and "sequence the inspection," (p. 286), whereas Dreher (1992) proposes a similar single step of "select appropriate text sections or categories for inspection" (p. 369). The focus of both models is selection of appropriate text to search. What does research tell us about children's ability to select appropriate text?

In brief, research suggests that the ability to select appropriate text to search is a developmental process: Older and more proficient readers are more able to select appropriate text categories than are younger and less proficient readers.

One study supporting this conclusion was conducted by Grabe (1989), using a computer-controlled reading task with more and less able fourth-grade readers. On each computer screen, the stem from a multiple-choice question appeared, followed by a paragraph from the story. The reader was asked to determine whether the answer to the question could be found within the paragraph. For this highly structured task, the better readers were significantly more accurate than the poorer readers in identifying goal-relevant text.

Other research on category selection in elementary children was conducted by Kobasigawa and colleagues. In the first study, Kobasigawa, Ransom, and Holland (1980) studied children's knowledge about skimming as a strategy to locate specific information in text. Fourth, sixth, and eighth graders were directed to find specific types of information in short passages. In one passage, the information could be located most efficiently by skimming the first sentence of the paragraph; in another passage, the information could be found by skimming the entire passage for a key word. Students were also interviewed to determine their awareness of skimming. Children at all three grade levels had knowledge of relevant text features, such as the function of first sentences of paragraphs and how relevant information may be expressed in prose. Children at all levels were also able to skim when explicitly instructed to do so. However, spontaneous skimming as a strategy to locate specific information developed only gradually with age.

In the Kobasigawa (1983) study alluded to in the last section, the researcher also investigated the ability of fourth and eighth graders to select search areas in response to a given research question. Specifically, the children were told: "One child in the class, Jack, said 'I want to find out why China cannot produce

enough food even when many people are working on farms.' Jack found several books on China" (p. 264). Then the subjects were asked how Jack could quickly find out what topics are in the first book and what key words he should look up in the index. Eighty percent of the fourth graders and all of the eighth graders responded that the index, table of contents, or both, could be used to find relevant topics, while 40% of the fourth graders and all of the eighth graders suggested at least one topic or key word to look up in an index. The fourth-grade students restricted their retrieval words to *farming* and *food*, words appearing in the given research question, but about one third of the eighth-grade students were able to propose additional key words, such as *population*, *climate*, and *soil*. Next, the students were provided with a copy of the table of contents of a book and asked to identify the three most relevant chapters. Under this more structured task situation, the fourth graders behaved much like the older students in their ability to indicate what chapters they should select.

In this study, then, eighth-grade students were able to narrow the search area with considerably less direction than were the fourth-grade students. As in the Kobasigawa et al. (1980) study, these results suggest that younger children may have the requisite knowledge to locate information, but they access this knowledge only under very structured or scaffolded conditions; older children, on the other hand, can spontaneously access knowledge needed for appropriate category selection.

Other research bearing on category selection has focused on "the lookback strategy," as mentioned in the previous section. Garner, Macready, and Wagoner (1984) investigated the order in which the components of the strategy are acquired. Using a methodology similar to that of the previously cited Garner et al. (1983) study, Garner, Macready, and Wagoner (1984) observed fifth graders at two reading proficiency levels as they assisted third graders in reading and answering text- and reader-based questions about an expository passage. The researchers determined that both proficient and less proficient fifth-grade readers acquired the components of the lookback strategy in the following order: (a) *undifferentiated rereading*--readers simply reaccess the entire text to locate unrecalled information; (b) *text sampling*--readers scan the text, rereading only the portion deemed critical to meeting the goal; (c) *question differentiation*--readers discriminate text-based from reader-based questions, rereading text only for questions that cue reaccessing the text; and (d) *text manipulation*--readers integrate information across phrase and sentence boundaries in order to answer questions. The first three stages of this sequence probably fall within the text selection component of the information location model. Consistent with other research, the Garner, Macready, and Wagoner (1984) description of the acquisition of the lookback strategy suggests an increasingly sophisticated approach to text selection.

Garner, Macready, and Wagoner (1984) also noted that the less proficient fifth-grade readers in this study were more successful than the sixth-grade readers of the previously cited Garner and Reis (1981) study. The researchers suggested that upper elementary students may know about the text-lookback strategy but fail to use it spontaneously under ordinary text-processing situations. It may take a special prompt, such as having to tutor someone else, to get children to use the strategy components.

Information Extraction and Integration

For the Guthrie and Mosenthal (1987) process model, the fourth step is "Extract details from one or more categories" (p. 286), which involves "distinguishing important from less important detail and extracting what is important" (p. 287). In Dreher's (1992) model, the third and fourth components are "extract relevant information from the inspected categories," and "integrate the extracted information with prior knowledge" (p. 369). We have combined these components of the two models in this section. In our framework of the search process, information extraction and integration proceed logically from the actions of goal formation and text selection.

We begin with the assumption that the more specific the search goal, the less information extraction and integration are likely to be required. For example, the children in the Kobasigawa et al. (1980) study,

who were asked "to find just one thing: How cold is it in Vancouver in the winter?" (p. 173), had to extract only one detail from the passage. The children who were successful at this task reported that they would "skim the story for a number and the degree symbol" (p. 173), or "look over the story quickly for the word temperature" (p. 173), thus implying the need for minimal integration with prior knowledge. As search goals become more general, however, readers probably need to extract and integrate more information. For example, if the children in Kobasigawa's (1983) study had actually been required to use the provided books to research the question of why China cannot produce enough food even when many of its people work on farms, they might have had to extract and synthesize information from several sources, drawing considerably on their prior topic knowledge during the process.

Research suggests that younger and less proficient readers have more difficulty than older and more proficient readers as search goals become more general. Support for this point comes from the results of standardized tests. Because students have access to the test passages when they answer standardized test questions, the questions could serve as search goals. (Of course, if students read the passage first and then try to answer the questions from memory, without referring back to the passage, the task involves recalling rather than locating information.)

We focus here on the results of the 1988 National Assessment of Educational Progress (NAEP), which was administered to a sample of fourth-, eighth-, and twelfth-grade students. The NAEP was designed to assess two purposes for reading: constructing meaning and examining meaning. The definition of these purposes describes how they intersect with the process of information location.

> Constructing meaning involves understanding what is read by focusing on either specific information or the overall message. Reading to understand *specific information* occurs when readers find and use details that appear either within or across the sentences of a text. Readers locate certain information and make a variety of text-based inferences. In contrast, reading to get the *overall message* occurs when readers go beyond the details, to infer important concepts and link them across parts of a text, interpret the author's purpose, or reflect on dominant stylistic features. Although they are distinguished in the assessment for purposes of analysis and reporting, many school-based reading experiences involve a blending of both behaviors. For example, using a reference book to locate and take notes on relevant material for a book report may involve locating and understanding particular information as well as the overall point. (Langer, Applebee, Mullis, & Foertsch, 1990, p. 67)

Among the results of the NAEP was the finding that across grade levels, "more students understand the details of what they read than the overall message, particularly for informative passages" (p. 68). Questions about specific passage information were answered correctly by nearly three fourths of the students, but only about two thirds were able to answer main idea-type questions. Furthermore, performance on both types of questions increased substantially from fourth to eighth grade, particularly for informational passages.

A great deal of research on reading comprehension supports the notion that children have difficulty understanding and remembering main ideas, particularly if those main ideas are implicit in the text (e.g., Baumann, 1983; Hare, Rabinowitz, & Schieble, 1989.; Kintsch, 1990; Winograd, 1984). For example, in the study by Hare et al. (1989), fourth-, sixth-, and eleventh-grade students were asked to select or construct main ideas of informational paragraphs. There were no significant differences among grades for explicit main ideas, but for implicit main ideas, the performance of fourth graders was significantly inferior. These results suggest that performance on search tasks involving the identification of implicit main ideas is associated with developmental differences.

In the study by Kintsch (1990), sixth graders, tenth graders, and college students were asked to write summaries and answer questions about an informational passage. (Because the passages were available to the subjects as they responded to the tasks, this study qualifies as research on locating information.) Compared to the older students, the sixth graders produced significantly fewer generalizations, were more likely to follow the order of information in the original text, and were less likely to engage in spontaneous inferencing. In sum, as Kintsch puts it, "recent studies have provided evidence that school children and even more advanced students are not efficient macroprocessors of school-type, expository texts" (p. 162).

A final bit of evidence about the developmental nature of information extraction and integration comes from the Garner, Macready, and Wagoner (1984) study of the acquisition of the components of the lookback process. Recall that these researchers determined that *text manipulation* is the last component to develop. Considered by the researchers to be the most demanding component, text manipulation involves information extraction and integration.

Evaluation

For both the Guthrie and Mosenthal (1987) and Dreher (1992) models, the last component of the search process is "recycling" through the prior components until the search task is completed, (i.e., the goal attained). This stage involves monitoring progress and evaluating outcomes--in short, metacognition.

A substantial body of research suggests that metacognition is a major variable distinguishing older and better readers from younger and poorer readers (e.g., Brown et al., 1983). That is, the development of metacognition is related to proficiency in learning from text. However, there appears to be little research on metacognition associated specifically with children's attempts to locate information in text.

We were able to locate only one study that directly investigated children's ability to evaluate information gathered in response to a hypothetical search task. The aforementioned Kobasigawa (1983) study included a task in which the fourth- and eighth-grade subjects were asked to read another student's research report and evaluate how well it answered three specific questions. In general, the younger children were not sensitive to the need to evaluate the reported information against the given questions. However, when directly asked whether the report answered a particular research question, the fourth graders were able to state correctly that the report did not include all required information. Therefore, fourth-grade children appear to have the ability to recognize what constitutes appropriate solutions to search tasks, but they often fail to use that ability spontaneously to evaluate gathered information.

Other Factors Related to the Search Process

So far, this review suggests a developmental trend to each component of the process of locating information in text. From formulating a goal through evaluating progress toward that goal, older and more proficient readers tend to perform better than younger and less proficient readers. However, a number of interrelated factors besides age and reading achievement influence the process of locating information in text. The "tetrahedral model" popularized by Brown and colleagues (e.g., Brown et al., 1983) specifies a minimum of four highly interactive factors that should be taken into account when considering any aspect of learning: (a) the learner's activity, (b) characteristics of the learner, (c) the nature of the materials to be learned, and (d) the criterial task. Although one may argue that locating information does not involve comprehension or learning (Guthrie & Kirsch, 1987), the tetrahedral model nonetheless offers a useful framework for considering the complex process of text search.

The first factor of the tetrahedral model is, of course, the major focus of this report--the particular activity of locating information in text (the process and its component subprocesses). The second factor has been partially addressed, in the learner characteristics of age and general reading proficiency. The

influence of the fourth factor, the criterial task, has been discussed both theoretically (as captured in Figure 1) and empirically, within the context of several stages of the search process model. In this section we consider the third factor--the nature of the materials to be learned--and additional aspects of the second factor--characteristics of the learner.

The text that children are most likely to search in school and beyond is expository, or informational, text. Unfortunately, elementary children have greater difficulty comprehending informational text than narrative text (Cox, Shanahan, & Tinzmann, 1991; Kintsch, 1990; Langer et al., 1990). There are doubtless many reasons why this is the case, but we will mention only two reasons here. First, informational text is comprised of a number of organizational patterns or discourse structures (e.g., description, comparison/contrast, temporal sequence, explanation, problem-solution) that are not as familiar to elementary children as the structure of narrative text (e.g., Englert & Hiebert, 1984; Hiebert, Englert, & Brennan, 1983; Taylor, 1980; Taylor & Samuels, 1983). If children are not familiar with the structure of informational text, they are unlikely to be able to locate information efficiently and effectively. Second, informational text, particularly the subject matter textbooks that are often the medium for text searches in elementary school, are sometimes "inconsiderate" to the reader (Armbruster, 1984). When text is poorly organized, lacks coherence, and provides inadequate explanations, it is likely to impede successful search.

In addition to age and general proficiency in reading, a multitude of other characteristics will affect children's ability to locate information in text, including both affective (e.g., interest, motivation) and cognitive variables. We will restrict our brief discussion here to the cognitive variable of prior knowledge. Many kinds of prior knowledge influence reading and learning. (See Alexander, Schallert, & Hare, 1991, for a useful framework of terminology for the various kinds of prior knowledge.) One important category of prior knowledge is *text-structure knowledge*. Text-structure knowledge relevant to information location includes knowledge of the organization of global features of textbooks and reference books (i.e., the function of tables of content, indices, headings, etc.). Other relevant text-structure knowledge includes knowledge of the organizational patterns of the prose itself, as mentioned in the preceding paragraph. According to research on learning from text, (a) knowledge of text structure is highly related to comprehension and learning (Englert & Hiebert, 1984; Englert, Stewart, & Hiebert, 1988; Hare et al., 1989; Hiebert et al., 1983; Meyer, Brandt, & Bluth, 1980; Taylor, 1980; Taylor & Samuels, 1983); and (b) knowledge of text structure is acquired developmentally (Brown & Smiley, 1977; Englert & Hiebert, 1984; Englert & Thomas, 1987; Winograd & Bridge, 1986; Wong & Wilson, 1984). These conclusions suggest that the efficiency and effectiveness of the search process in elementary children may be hampered by their relative unfamiliarity with informational text, including its characteristic structures.

Another type of prior knowledge critical for information location is *topic knowledge*, or "the intersection between one's prior knowledge and the content of a specific passage" (Alexander et al., 1991, p. 334). For our purposes, topic knowledge refers to the reader's knowledge about the information contained in the text that is being searched. The more the reader knows about the topic, the more efficient the search is likely to be. Evidence for this conclusion is found in the Kobasigawa (1983) study. Recall that when the children were asked what key words they should look up in the index or what chapter they should look in to answer the given retrieval question, only about one third of the older students were able to suggest key words in addition to terms appearing in the question itself. Kobasigawa concluded that the older students were using their "general knowledge" (what we are calling topic knowledge) to generate additional search possibilities.

In this section, we discussed some factors other than age and reading proficiency that influence children's ability to locate information in text. In particular, we focused on the nature of the text being searched and on the reader's prior knowledge (both text-structure and topic knowledge). The search process can be impeded or facilitated as a function of these factors, among others. For example,

consider the case in which a less proficient fourth-grade reader is attempting to locate information on why cowboys wear bandannas. Her search will be facilitated to the extent that (a) the text she is searching is considerate, (b) she has knowledge of the relevant text characteristics, such as how the information is organized, and (c) she is informed about cowboys (e.g., their environment and the nature of their work).

Implications for the Classroom

Results from standardized tests and the research reviewed here suggest that elementary children have difficulty locating information, particularly when the goal is more general and the text is informational. In this section we explore some prevailing instructional practices that may contribute to this difficulty. We end with some recommendations about how teachers can help children become better at locating information in text.

Problems with Prevailing Practices

One reason elementary children are not better text searchers is that they have not been taught how to do so. Most reading instruction is heavily influenced by basal reading programs (Anderson, Hiebert, Scott, & Wilkinson, 1985). The scope and sequence charts of basal reading programs typically contain a skill strand on "locating information." But this skill tends to be restricted to just a small part of the "text selection" component of the search process model discussed here. Specifically, "locating information" in basal programs consists of subskills such as alphabetical order, book parts (table of contents, index, glossary), and reference materials (e.g., dictionary, encyclopedia, atlas, card catalog). Not only is locating information narrowly conceived in basal programs, but it is also probably taught ineffectively. Durkin (1981) found the instruction in basal reading programs to be light on direct, or explicit, instruction and heavy on the practice or assessment of skills. Armbruster and Gudbrandsen (1986) found similar results for basal social studies programs: Locating information is narrowly conceived, and students are provided scant instruction on how to do the tasks. The results of these studies suggest that elementary students may not be receiving much substantive instruction on the full process of locating information in text.

A second reason that elementary children may not be so adept at locating information is that they do not get much practice reading in general, much less reading informational texts of the kind they would be likely to use in search tasks. According to Langer and colleagues (1990), "Students across the grades appear to spend little time each week reading for school or for pleasure on their own" (p. 9). Goodlad (1984) reported that elementary students engage in silent, independent reading during only 6% of total class time, while Anderson and colleagues (1985) estimated that 7-8 minutes per day is spent reading in school.

Of the small amount of reading that elementary children do, very little of it is informational text (Cox et al., 1991). The basal readers that constitute the majority of elementary children's reading material contain primarily fictional selections, such as stories, poems, and plays (Flood & Lapp, 1990). The few nonfiction selections usually bear little resemblance to the informational text of content area textbooks (Beck, McKeown, & Gromoll, 1987). Even in subject-matter instruction, where textbooks also predominate (Tyson-Bernstein, 1988), most students do not learn most content by reading their textbooks. They rely rather on their teachers' presentations of content through lectures, discussions, films, and hands-on activities (Armbruster et al., 1991; Goodlad, 1984; Stodolsky, 1989).

In sum, elementary children appear to be getting little practice with reading in general and with reading informational text in particular. Without practice reading informational text, children will not gain the text-structure knowledge they need to search effectively.

A third instructional practice that may contribute to children's difficulty with locating information is limited experience with the range of possible types of search tasks, as represented in Figure 1. In the "Goal Formation" section of this article, we presented evidence suggesting that children may spend a disproportionate amount of time locating information to meet very specific, externally imposed goals, such as questions asked by teachers or textbooks. It may be that children are getting little practice in searching text in response to other types of goals. For example, we reviewed research suggesting that students are not very familiar with the type of internal goals motivated by confusion or forgetting that would initiate text lookbacks.

Recommendations

Because locating information is a form of strategic reading, it seems to us that recommendations for improving children's ability to locate information in text should closely resemble more general recommendations for helping children comprehend and learn from text, particularly informational text. Such recommendations are legion (e.g., Pearson & Fielding, 1991), but in this section we will focus on just two major recommendations that seem particularly relevant to searching text.

Our first major recommendation is to provide systematic instruction in how to locate information in text, beginning in the primary grades. The instruction should cover each component of a process model of information location, such as the Guthrie and Mosenthal (1987) or Dreher (1992) models. Using our modified version of these models, we offer the following suggestions for each stage.

Goal formation. Students should be informed about, and have plenty of experience with, all the possible types of tasks or goals that could instigate a text search. We think it is particularly important for children to have greater experience with internal goals and with more general goals. Perhaps Figure 1 could serve as a guide for systematically generating a full range of search tasks.

One aspect of instruction concerning goals should involve teaching children "question differentiation" (Garner, Macready, & Wagoner, 1984)--discriminating types of tasks that require text search from those that do not. Recommendations for such instruction are presented in Raphael (1986). These recommendations for teaching question-answer relationships (QARs) are based on research conducted by Raphael and her colleagues (Raphael, 1984; Raphael & McKinney, 1983; Raphael & Pearson, 1985; Raphael & Wonnacott, 1985), in which elementary students were taught procedures for discriminating among types of text-based and reader-based questions.

Instruction about goal formation should also attend to the internal goal of fixing up a comprehension or memory failure. Apparently, students often feel that text lookbacks are "illegal" (Garner, Hare, Alexander, Haynes, & Winograd, 1984). They need to learn that a problem with understanding or remembering information during or after reading *should* instigate a text lookback. Suggestions for instruction in the text lookback strategy are offered by Garner, Hare, Alexander, Haynes, and Winograd. These researchers taught upper elementary and middle school readers why, when, and where to use text lookbacks, thereby enabling them to use lookbacks and answer questions more successfully.

Text selection. We agree that children should be taught the more global aspect of text selection that is currently emphasized in commercially published programs, such as how to use book parts and reference materials. However, research does not support the manner in which basal programs teach reading--as a structured sequence of discrete skills and strategies--at least beyond the beginning stages of reading (Pearson, Roehler, Dole, & Duffy, 1992). Therefore, we believe that children should learn how to use book parts and reference materials within the context of pursuing authentic search goals.

Instruction in text selection should extend beyond using book parts and reference materials, however. Students should also learn procedures for "text sampling" (Garner, Macready, & Wagoner,

1984)--scanning or skimming the text for the information relevant to the question and then selecting a segment of text for close inspection. "Key word" searches (e.g., Raphael, 1986) are probably the most common way text sampling is accomplished. Unfortunately, we could find no research-based recommendations on how to teach this aspect of text selection.

Information extraction and integration. This component of extracting relevant information and integrating it with prior knowledge involves the sort of constructive process that is at the heart of reading comprehension. Therefore, any research on instruction to facilitate reading comprehension in general is probably applicable to this stage.

Because Guthrie and Mosenthal (1987) mention distinguishing important from less important information in relationship to this component, instruction on main ideas and summaries seems a likely place to start. Pearson and Fielding (1991) review a number of studies on summarizing and determining main ideas. Studies done over the past decade show that "helping students learn how to summarize the texts they read has a positive effect on their comprehension and recall of text" (p. 835). Pearson and Fielding suggest that better designed instruction is one reason why recent studies have shown positive results for summarizing whereas older studies did not show such an effect. Therefore, the research cited by Pearson and Fielding (1991) is a good place to find suggestions on how to teach elementary students about the component of information extraction and integration.

Evaluation. Evaluating whether the search has met the goal involves metacognition. Therefore, any instruction that helps students become more proficient comprehension monitors is likely to facilitate this stage of the search process. Brown et al. (1983) discuss intervention studies that facilitate comprehension monitoring in children. Teaching students to self-verbalize (i.e., engage in internal speech) about the goal and their progress toward attaining it may be a particularly potent method of fostering self-evaluation (Pearson & Fielding, 1991).

Summary. Our first major recommendation is that elementary teachers provide systematic instruction in how to locate information in text. We have offered a few references for research-based recommendations for explicit instruction in the components of the search process. We recommend making use of explicit instruction when possible. But we also believe that much of the process of locating information in text may only be learned, or may be learned best, through teacher and peer modeling and plenty of practice with diminishing amounts of scaffolding.

Our second major recommendation is to add much more informational text to the reading diet of elementary students. Children must be very familiar with informational text to be able to search it effectively. Experience with informational text should begin in kindergarten, even before children are able to read independently. One source of informational text is nonfiction trade publications (materials available in libraries and book stores), including both books and magazines. In addition, we think that throughout elementary school, children should have extensive experience with textbooks in various subject matter areas and with a full range of reference materials.

A related recommendation is that children should be taught about informational text, particularly the way it is structured. In their extensive review of reading comprehension instruction, Pearson and Fielding (1991) conclude,

> In general, we have found incredibly positive support for just about any approach to text structure instruction for expository text. It appears that any sort of systematic attention to clues that reveal how authors attempt to relate ideas to one another or any sort of systematic attempt to impose structure upon a text, especially in some sort of visual rerepresentation of the relationships among key ideas, facilitates comprehension as well as both short-term and long-term memory for the text. (p. 832)

BEST COPY AVAILABLE

We believe that text structure instruction will also facilitate children's ability to locate information in text. Pearson and Fielding discuss and provide references for many different approaches to text structure instruction, most of which are appropriate for elementary children.

Closing Remarks

Researching and writing this review certainly heightened our awareness of how little is known about the process of locating information with regard to children. We could find almost nothing about the kinds of information elementary children are expected to find in text or the types of text searches they do. As we tried to organize our review around existing models of the information-location process, we were struck by the dearth of research pertaining to the competencies of children at each stage. Finally, we were hard pressed to find research-based recommendations for instruction to help children become better at locating information in text. We hope this review inspires further research efforts.

References

Alexander, P. A., Schallert, D. L., & Hare, V. C. (1991). Coming to terms: How researchers in learning and literacy talk about knowledge. *Review of Educational Research, 61,* 315-343.

Alvermann D. E., & Hayes, D. A. (1989). Classroom discussion of content area reading assignments: An intervention study. *Reading Research Quarterly, 24,* 305-335.

Anderson, R. C., Hiebert, E. H., Scott, J. A., & Wilkinson, I. A. G. (1985). *Becoming a nation of readers: The report of the Commission on Reading.* Champaign, IL: Center for the Study of Reading; Washington, DC: National Institute of Education.

Armbruster, B. B. (1984). The problem of "inconsiderate text." In G. G. Duffy, L. R. Roehler, & J. Mason (Eds.), *Comprehension instruction: Perspectives and suggestions* (pp. 202-217). New York: Longman.

Armbruster, B. B., Anderson, T. H., Armstrong, J. O., Wise, M. A., Janisch, C., & Meyer, L. A. (1991). Reading and questioning in content area lessons. *Journal of Reading Behavior, 23,* 35-59.

Armbruster, B. B., & Gudbrandsen, B. (1986). Reading comprehension instruction in social studies programs. *Reading Research Quarterly, 21,* 36-48.

Armbruster, B. B., & Ostertag, J. (in press). Questions in elementary science and social studies textbooks. In B. Britton, M. Goldberg, & M. Binkley (Eds.), *Learning from textbooks: Theory and practice*. Hillsdale, NJ: Erlbaum.

Baumann, J. F. (1983). Children's ability to comprehend main ideas in content textbooks. *Reading World, 22,* 322-331.

Beck, I. L., McKeown, M. G., & Gromoll, E. W. (1987). *Issues that may affect social studies learning: Examples from four commercial programs*. Pittsburgh, PA: University of Pittsburgh, Learning Research and Development Center, Center for the Study of Learning.

Bloom, B. S., Engelhart, M. D., Furst, E. J., Hill, W. H., & Krathwohl, W. H. (1956). *Taxonomy of educational objectives: The classification of educational goals. Handbook I: Cognitive domain*. New York: Longman.

Brown, A. L., Bransford, J. D., Ferrara, R. A., & Campione, J. C. (1983). Learning, remembering, and understanding. In J. H. Flavell & E. M. Markman (Eds.), *Handbook of child psychology* (Vol. 3, 4th ed., pp. 77-166). New York: Wiley.

Brown, A. L., & Smiley, S. S. (1977). Rating the importance of structural units of prose passages: A problem of metacognitive development. *Child Development, 48,* 1-8.

Ciardello, A. V. (1986). Teacher questioning and student interaction: An observation of three social studies classes. *Social Studies, 77,* 119-122.

Cox, B. E., Shanahan, T., & Tinzmann, M. B. (1991). Children's knowledge of organization, cohesion, and voice in written exposition. *Research in the Teaching of English, 25,* 179-218.

Daines, D. (1986). Are teachers asking higher level questions? *Education, 106,* 368-274.

Davis, O. L., Jr., & Hunkins, F. P. (1965). Textbook questions: What thinking processes do they foster? *Peabody Journal of Education, 43,* 285-292.

Dreher, M. J. (1992). Searching for information in textbooks. *Journal of Reading, 35,* 364-371.

Durkin, D. (1981). Reading comprehension instruction in five basal reading series. *Reading Research Quarterly, 16,* 515-544.

Englert, C. S., & Hiebert, E. H. (1984). Children's developing awareness of text structures in expository materials. *Journal of Educational Psychology, 76,* 65-74.

Englert, C. S., Stewart, S. R., & Hiebert, E. H. (1988). Young writers' use of text structure in expository text generation. *Journal of Educational Psychology, 80,* 143-151.

Englert, C. S., & Thomas, C. C. (1987). Sensitivity to text structure in reading and writing: A comparison between learning disabled and non-learning disabled students. *Learning Disability Quarterly, 10,* 93-105.

Flood, J., & Lapp, D. (1990). Type of writings included in basal reading programs, kindergarten through second grade: An investigation of changes from 1983 to 1989. In Zutell, J., & McCormick, S. (Eds.), *Literacy theory and research: Analyses from multiple paradigms: Thirty-seventh Yearbook of the National Reading Conference* (pp. 395-401). Chicago, IL: The National Reading Conference.

Gall, M. D. (1970). The use of questions in teaching. *Review of Educational Research, 40,* 707-721.

Gall, M. D. (1984). Synthesis of research on teacher's questioning. *Educational Leadership, 42,* 40-47.

Garner, R., Hare, V. C., Alexander, P., Haynes, J., & Winograd, P. (1984). Inducing use of a text lookback strategy among unsuccessful readers. *American Educational Research Journal, 21,* 789-798.

Garner, R., Macready, G. B., & Wagoner, S. (1984). Reader's acquisition of the components of the text-lookback strategy. *Journal of Educational Psychology, 76,* 300-309.

Garner, R., & Reis, R. (1981). Monitoring and resolving comprehension obstacles: An investigation of spontaneous text lookbacks among upper-grade good and poor comprehenders. *Reading Research Quarterly, 26,* 569-582.

Garner, R., Wagoner, S., & Smith, T. (1983). Externalizing question-answering strategies of good and poor comprehenders. *Reading Research Quarterly, 18,* 439-447.

Good, T. L., & Brophy, J. E. (1973). *Looking in classrooms.* New York: Harper & Row.

Goodlad, J. I. (1984). *A place called school.* New York: McGraw-Hill.

Grabe, M. (1989). Evaluation of purposeful reading skills in elementary-age students. *Journal of Educational Psychology, 81,* 628-630.

Guthrie, J. T., & Kirsch, I. S. (1987). Distinctions between reading comprehension and locating information in text. *Journal of Educational Psychology, 79,* 220-227.

Guthrie, J. T., & Mosenthal, P. (1987). Literacy as multidimensional: Locating information and reading comprehension. *Educational Psychologist, 22,* 279-297.

Guszak, F. J. (1967). Teacher questioning and reading. *The Reading Teacher, 21,* 227-234.

Hare, V. C., & Pulliam, C. A. (1980). Teacher questioning: A verification and an extension. *Journal of Reading Behavior, 12,* 69-72.

Hare, V. C., Rabinowitz, M., & Schieble, K. M. (1989). Text effects on main idea comprehension. *Reading Research Quarterly, 24,* 72-88.

Hiebert, E. H., Englert, C. S., & Brennan, S. (1983). Awareness of text structure in recognizing and producing expository discourse. *Journal of Reading Behavior, 15,* 63-80.

Kintsch, E (1990). Macroprocesses and microprocesses in the development of summarization skill. *Cognition and Instruction, 7,* 161-195.

Kobasigawa, A. (1983). Children's retrieval skills for school learning. *The Alberta Journal of Educational Research, 29,* 259-271.

Kobasigawa, A., Ransom, C. C., & Holland, C. J. (1980). Children's knowledge about skimming. *The Alberta Journal of Educational Research, 26,* 169-182.

Langer, J. A., Applebee, A. N., Mullis, I. V. S., & Foertsch, M. A. (1990). *Learning to read in our nation's schools: Instruction and achievement in 1988 at grades 4, 8, and 12.* Princeton, NJ: Educational Testing Service.

Meyer, B. J. F., Brandt, D. M., & Bluth, G. J. (1980). Use of top level structure in text: Key for reading comprehension of ninth-graders. *Reading Research Quarterly, 16,* 72-101.

O'Flahavan, J. E., Hartman, D. K., & Pearson, P.D. (1988). Teacher questioning and feedback practices: A twenty-year retrospective. In J. E. Readence & R. S Baldwin (Eds.), *Dialogues in literacy research: Thirty-seventh yearbook of the National Reading Conference* (pp. 185-191). Rochester, NY: The National Reading Conference.

Pearson, P. D., & Fielding, L. (1991). Comprehension instruction. In R. Barr, M. L. Kamil, P. Mosenthal, & P. D. Pearson (Eds.), *Handbook of reading research* (Vol. 2, pp. 815-860). New York: Longman.

Pearson, P. D., & Gallagher, M. E. (1983). The instruction of reading comprehension. *Contemporary Educational Psychology, 8,* 317-344.

Pearson, P. D., & Johnson, D. D. (1978). *Teaching reading comprehension.* New York: Holt, Rinehart & Winston.

Pearson, P. D., Roehler, L., Dole, J., & Duffy, G. (1992). Developing expertise in reading comprehension. In S. J. Samuels & A. E. Farstrup (Eds.), *What research says to the teacher* (2nd ed., pp. 145-199). Newark, DE: International Reading Association.

Raphael, T. E. (1984). Teaching learners about sources of information for answering comprehension questions. *Journal of Reading, 27,* 303-311.

Raphael, T. E. (1986). Teaching question answer relationships, revisited. *The Reading Teacher, 39,* 516-522.

Raphael, T. E., & McKinney, J. (1983). An examination of fifth- and eighth-grade children's question-answering behavior: An instructional study in metacognition. *Journal of Reading Behavior, 15,* 67-86.

Raphael, T. E., & Pearson, P. D. (1985). Increasing students' awareness of sources of information for answering questions. *American Educational Research Journal, 22,* 217-236.

Raphael, T. E., Winograd, P., & Pearson, P. D. (1980). Strategies children use when answering questions. In M. L. Kamil & A. J. Moe (Eds.), *Perspectives on reading research and instruction: Twenty-ninth yearbook of the National Reading Conference* (pp. 56-63). Washington, DC: The National Reading Conference.

Raphael, T. E., & Wonnacott, C. A. (1985). Heightening fourth-grade students' sensitivity to sources of information for answering comprehension questions. *Reading Research Quarterly, 20,* 282-296.

Stodolsky, S. S. (1989). Is teaching really by the book? In R. W. Jackson & S. Harovtunian-Gordon (Eds.), *From Socrates to software: The teacher as text and the text as teacher: Eighty-ninth yearbook of the National Society for the Study of Education, Part I* (pp. 159-184). Chicago, IL: University of Chicago Press.

Taylor, B. M. (1980). Children's memory for expository text after reading. *Reading Research Quarterly, 15,* 399-411.

Taylor, B. M., & Samuels, S. J. (1983). Children's use of text structure in the recall of expository material. *American Educational Research Journal, 20,* 517-528.

Trachtenberg, P. (1974). Student tasks in text materials: What cognitive skills do they tap? *Peabody Journal of Education, 52,* 54-57.

Tyson-Bernstein, H. (1988). *A conspiracy of good intentions: American's textbook fiasco.* Washington, DC: The Council for Basic Education.

Wade, S., & Armbruster, B. (in press). *Learning from text.* Urbana-Champaign: University of Illinois, Center for the Study of Reading.

Wilen, W. W. (1982). *What research says to the teacher: Questioning skills for teachers.* Washington, DC: National Education Association.

Wilen, W. W. (1984). Implications of research on questioning for the teacher educator. *Journal of Research and Development in Education, 17,* 31-35.

Winograd, P. N. (1984). Strategic difficulties in summarizing texts. *Reading Research Quarterly, 19,* 404-425.

Winograd, P., & Bridge, C. (1986). The comprehension of important information in written prose. In J. F. Baumann (Ed.), *Teaching main idea comprehension* (pp. 18-48). Newark, DE: International Reading Association.

Wong, B. Y. L., & Wilson, M. (1984). Investigating awareness of and teaching passage organization in learning disabled children. *Journal of Learning Disabilities, 17,* 477-482.

Author Note

The work upon which this publication is based was supported in part by the Office of Educational Research and Improvement under Cooperative Agreement No. G0087-C1001-90 with the Center for the Study of Reading.

Figure 1.

Types of Search Goals or Tasks

Source of Goal	Time of Search			
	Before Reading		During/After Reading	
	Specific ----------> General		Specific ----------> General	
External	text-explicit question	assigned research on general topic	text-explicit question	find evidence in support of conclusion
Internal	locate fact	self-selected general research topic	spontaneous lookback to locate fact	spontaneous lookback to locate source of confusion